

METHOD AND STRUCTURE FOR REDUCTION OF CONTACT
RESISTANCE METAL SILICIDES USING A
METAL-GERMANIUM ALLOY

ABSTRACT OF THE DISCLOSURE

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10 A method of reducing the contact resistance of metal
silicides to the p+ silicon area or the n+ silicon area
of the substrate comprising: (a) forming a metal
germanium (Ge) layer over a silicon-containing substrate,
wherein said metal is selected from the group consisting
of Co, Ti, Ni and mixtures thereof; (b) optionally
15 forming an oxygen barrier layer over said metal germanium
layer; (c) annealing said metal germanium layer at a
temperature which is effective in converting at least a
portion thereof into a substantially non-etchable metal
silicide layer, while forming a Si-Ge interlayer between
20 said silicon-containing substrate and said substantially
non-etchable metal silicide layer; and (d) removing said
optional oxygen barrier layer and any remaining alloy
layer. When a Co or Ti alloy is employed, e.g., Co-Ge or
Ti-Ge, two annealing steps are required to provide the
lowest resistance phase of those metals, whereas, when Ni
25 is employed, a single annealing step forms the lowest
resistance phase of Ni silicide.